

## PATENT CLAIMS

- 1 A compensation apparatus for prevention of damaging bearing currents in an electrical machine (DM) having
  - a connection device for connection to at least one winding (MW), to the housing and to the rotor (RO) of the electrical machine (DM), and
  - a voltage production device for production of a compensation voltage ( $U_k$ ) for the rotor (RO) of the electrical machine as a function of the operating voltage ( $U_d$ ) which is applied to the at least one winding (MW), of the electrical machine.
2. The compensation apparatus as claimed in claim 1, in which the operating voltage which is applied to the winding (MW) is obtained from the drive signals of a voltage intermediate-circuit converter (UR).
3. The compensation apparatus as claimed in claim 1 or 2, in which the voltage production device has a transformer (T) whose primary winding is connected between the at least one winding (MW) and the housing of the electrical machine (DM), and whose secondary winding is connected between the rotor (RO) and the housing of the electrical machine (DM).
4. The compensation apparatus as claimed in claim 3, in which a network ( $Z_{T1}$ ,  $Z_{T2}$ ) for adaptation of the compensation voltage is connected in parallel with the primary winding or secondary winding.
5. The compensation apparatus as claimed in one of the preceding claims, in which the voltage production device has an active circuit (AS), by means of which the compensation voltage ( $U_k$ ) can be produced from the operating voltage ( $U_d$ ) which is applied to the electrical machine.

6. The compensation apparatus as claimed in one of the preceding claims, which has a star circuit by means of which the phases of the electrical machine are connected at a star point (SP), and in which the voltage ( $U_o$ ) at the star point (SP) is used as an input voltage for the voltage production device.
7. An electrical machine having a compensation apparatus as claimed in one of claims 1 to 6.
8. The electrical machine as claimed in claim 7, which is a three-phase electrical machine.
9. The electrical machine as claimed in claim 7 or 8, in which the windings (MW) of the electrical machine (DM) are connected at a star point (SP), and the voltage ( $U_o$ ) at the star point (SP) is used as an input voltage for the voltage production device.
10. A method for compensation for bearing currents in an electrical machine (DM) by
  - production of a compensation voltage ( $U_k$ ) for the rotor (RO) of the electrical machine (DM) as a function of an operating voltage ( $U_o$ ) of the electrical machine, and
  - application of the compensation voltage ( $U_k$ ) to the rotor (RO) of the electrical machine.
11. The method as claimed in claim 10, in which the compensation voltage ( $U_k$ ) is produced by a transformer (T) which transforms the primary voltage (which is applied to at least one of the windings (MW) of the electrical machine (DM)) for the compensation voltage ( $U_k$ ).

12. The method as claimed in claim 10, in which the compensation voltage ( $U_k$ ) is produced by an active circuit (AS).
13. The method as claimed in one of claims 10 to 12, in which the operating voltage ( $U_d$ ) of the electrical machine is a common-mode voltage.
14. The method as claimed in one of claims 10 to 13, in which the electrical machine is operated with three phases.
15. The method as claimed in claim 14, in which the windings (MW) of the electrical machine (DM) are interconnected at a star point (SP, SP'), and the voltage at the star point (SP, SP') is used to produce the compensation voltage ( $U_k$ ).
16. A compensation apparatus for prevention of damaging bearing currents having
  - a first connection for connection to the rotor (RO) of an electrical machine (DM),
  - a second connection for connection to the housing or a potential of a voltage intermediate-circuit converter (UR) of the electrical machine (DM), and
  - an impedance with a DC resistance and a high frequency reactance which is less than this, which impedance is connected between the first and the second connection.
17. An electrical machine having a compensation apparatus as claimed in claim 16.